Yummy Pizza!

Matter Energy Forces Machines Earth

Standard: 3240-03 : Students will relate forces and energy to motion.

Objective: 3240-0302: The student will identify the role of energy in motion.

Intended Learning Outcomes:
1a. Make observations and measurements (uses instruments as appropriate).
1d. Make estimations and predictions based on observations and current knowledge.
2e. Analyze data and draw warranted inferences.
2g. Construct models and simulations to describe and explain natural phenomena.
4e. Respect the contributions of science to the quality of human life.

This is a great activity to better understand the principles of reflective and conductive heat. Students will get into teacher-designated groups and prepare to bake one of the recipes below in a reflective cardboard oven. Each student must consume their creation and share with your teacher to receive full credit.

Teacher instructions for oven:

Materials
1 box with lid (like a computer paper box)
LOTS of (heavy duty) aluminum foil: shiny side out
Wire clothes hangers
Duct tape
An aluminum pie tin
A fume hood or may be done outside.
Charcoal briquets (Kingsford are the best...)
#10 large can for starting the briquets going (holes punched in bottom for air)
Matches; Lighter fluid if necessary
Metal tongs
Hot pads
Pie tin with a thin layer of sand or dirt in the bottom
Large cookie sheet

1) Encase both box and lid inside and out with tin foil. This reflects the heat in and keeps air away from combustible cardboard.
2) With the box on it's long side (opening towards you) poke holes in either end to accommodate the wire clothes hangers. The holes should be about half way up and you can run either three or four. This makes your shelf for the food.
3) Lay the oven on top of a cookie sheet to help protect hood surface.
4) Start your charcoal in a #10 can with openings poked around the bottom for air circulation within your fume hood.
5) When the briquets are turning white on their edges, use the metal tongs to place 8-10 briquets into the pie tin located below your "oven rack." (One briquet equals 30-40 degrees of heat (ex. 300 degrees F = 8-10 briquets)

Student recipe instructions:

French Bread Pizza
1 Loaf French Bread
1 jar pizza/spaghetti sauce
Shredded cheese (variety)
Assorted meats
Assorted vegetables

Slice French bread lengthwise; generously spread sauce on both halves; sprinkle on cheese and add favorite topping; protect the bottom of the pizza with a strip of foil; place in oven at 350 degrees for 30 minutes or until meat is cooked and cheese melted. Use hot pads to remove pizza. Share with teams.

Pineapple Upside-down Cake
1 cube butter
1 cup of brown sugar
1 large can of crushed pineapple
1 box yellow cake mix w/pudding
1 can maraschino cherries (optional)

Melt butter; add brown sugar &; pineapple into a 9 x 12 pan. Follow cake mix instructions except substitute 1 cup of milk for 1 cup of water; layer pineapple in bottom of pan; pour cake mix into pan on top of pineapple. Bake at 350 degrees for one hour. Share with pizza teams.

Conclusions:
1. Why doesn't the cardboard oven burn?

2. Why did you protect the bottom of the pizza with foil?

3. What is the purpose of the pie tin with the sand/dirt?

4. If you placed the briquettes directly on the bottom of the oven, what would eventually happen?

Safety concerns:

Teachers and students, be sure to keep all Heat and Chemical Safety Rules that are specified by your teacher and in all general laboratory experiences. This activity should either be done outside or inside under a fume hood!

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